Is there geometry here?

in art

in architecture

in room design

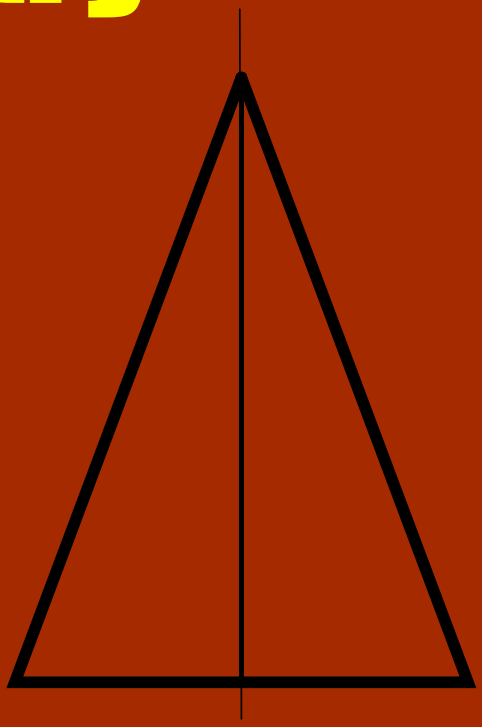
in graphics

in nature

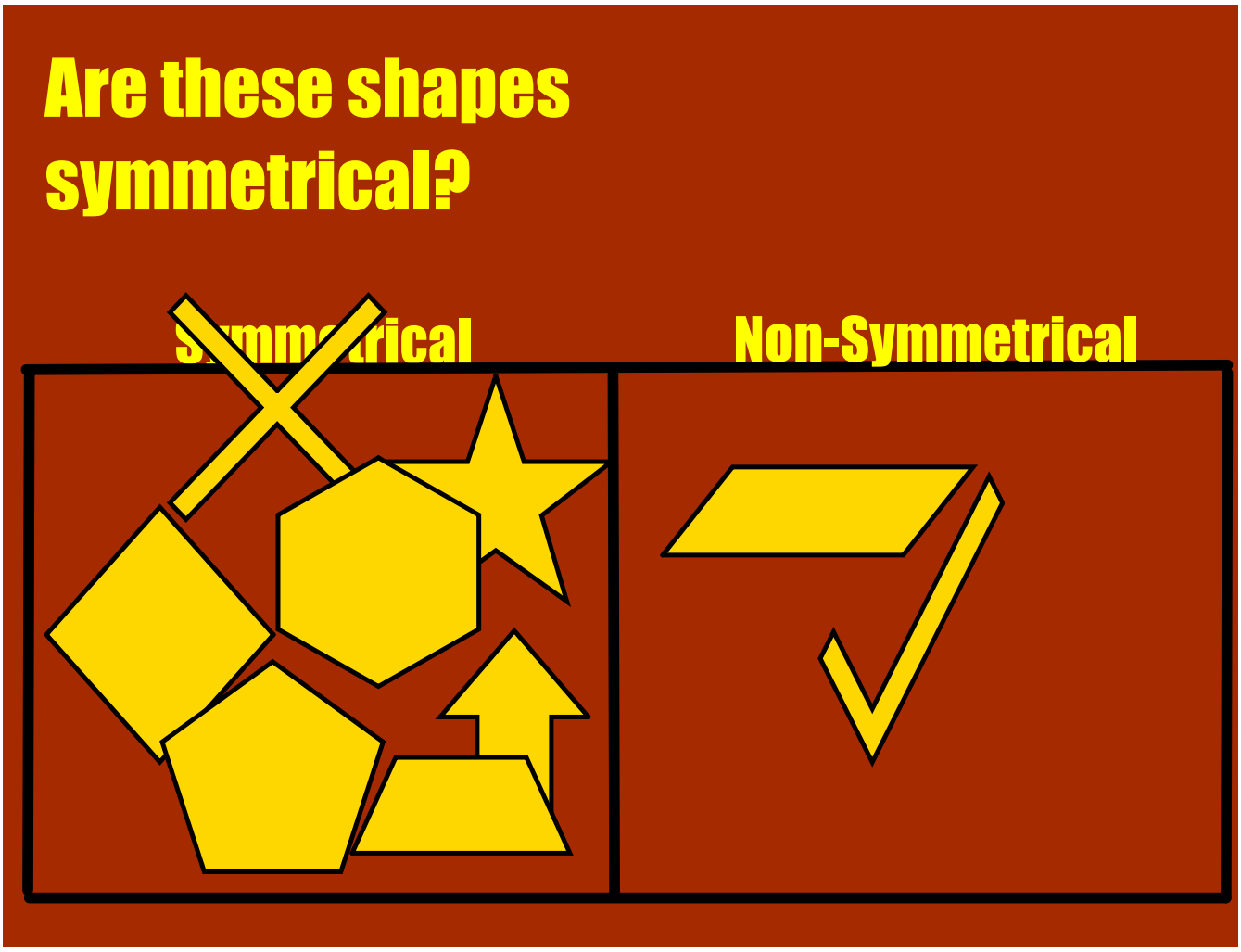
in humans

Symmetry

when opposite sides of a dividing line perfectly match

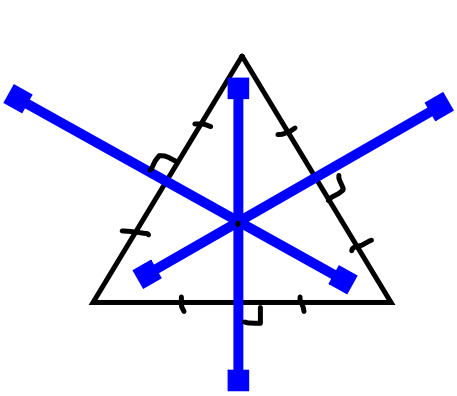


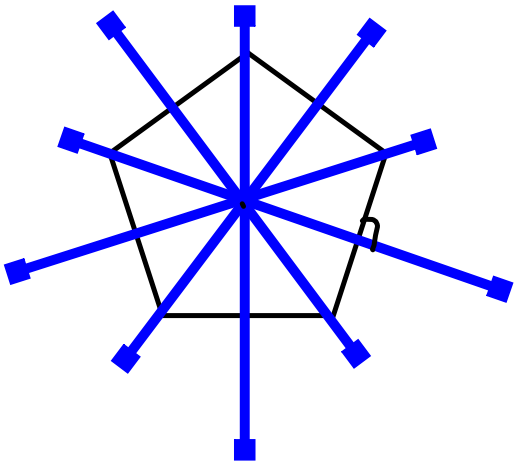
Are these shapes symmetrical?



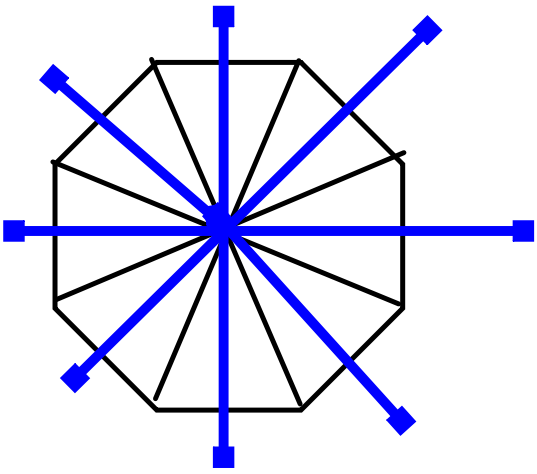
LESSON # 39 ~ Axes of Symmetry in Regular Polygons

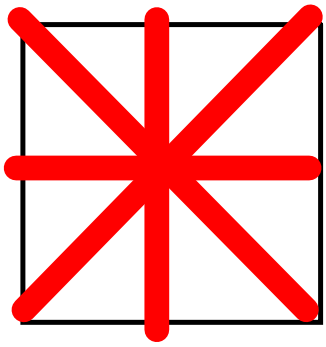
In a regular polygon with an odd number of sides (ex. 3, 5, 7, 9)
the perpendicular bisectors of all the sides always pass through the center.



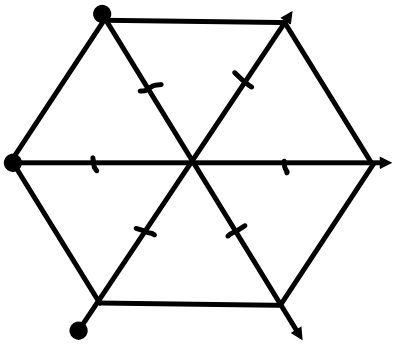


An even number of sides (ex. 4, 6, 8, 10, 12) can also work.
(corner to corner & side to side)





Every regular polygon can be divided into isosceles triangles, by joining the center to each vertex.

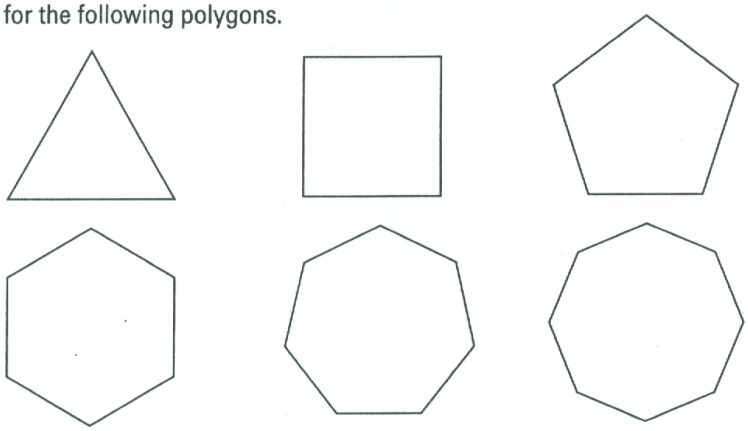


n

number of sides = # of axes
= # of triangles

WORKSHEET 25

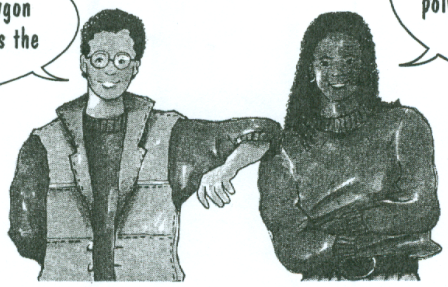
2) Anne thinks that all regular polygons have as many axes of symmetry as they have sides. Is she right? Verify this statement by drawing the axes of symmetry for the following polygons.



3) In my opinion, the axes of symmetry of a regular polygon all meet at one point, which is the centre of the polygon.

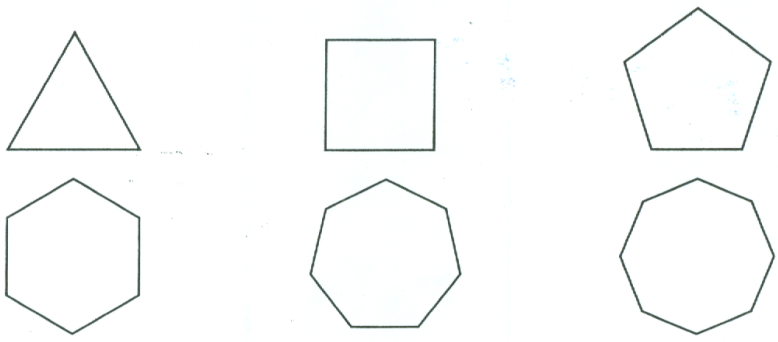
Is George right? Verify.

4) I think that the point of intersection of the axes of symmetry of a regular polygon is also the centre of a circle that passes through all the vertices of the polygon.



Is Julie right?
Check this statement
using the regular polygons below.

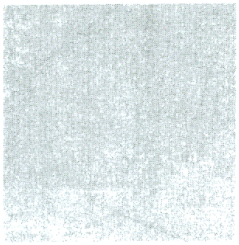
5) Denis states that every regular polygon can be divided into congruent isosceles triangles. Is he right? Check this statement using the polygons below.



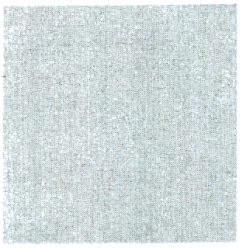
WORKSHEET 26

o) Construct a triangle with the exact number of axes of symmetry given.

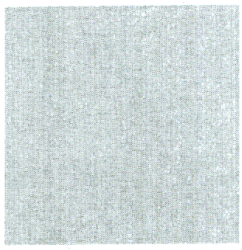
1) 0



2) 1

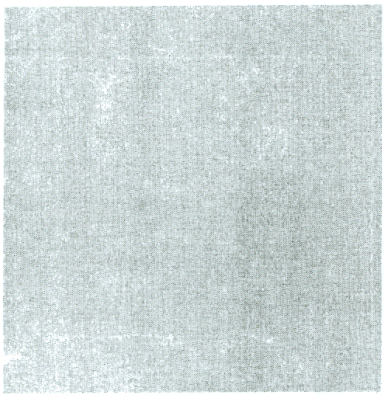


3) 3

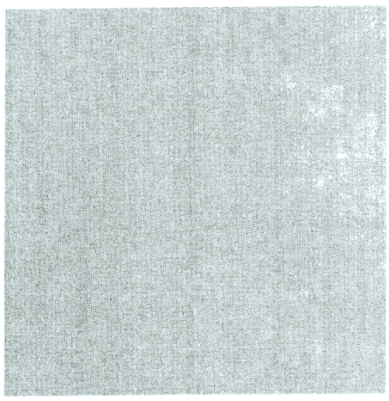


p) Construct a quadrilateral with the exact number of axes of symmetry given.

1) 0

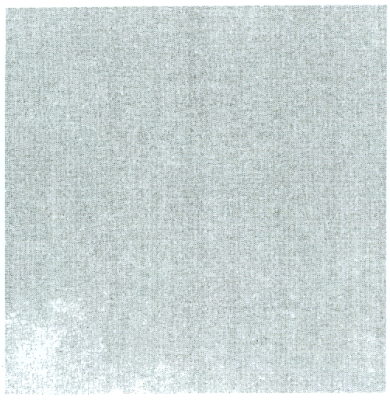


2) 1



3) 2

4) 4



Name:_____ Date:_____

Math Quiz Sec.2
Lesson 37, 38+39

20

2

1. Give the sum of the measures of the interior angles of each polygon.

a) Octagon._____ *b)* Triangle._____

2

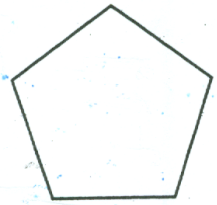
2. How many sides does a polygon have if the sum of its interior angle measures is:

a) 1620°?_____ *b)* 2340°?_____

2

3. Two different views of the sides of bird houses are shown. Draw in all axes of symmetry for each.

a)

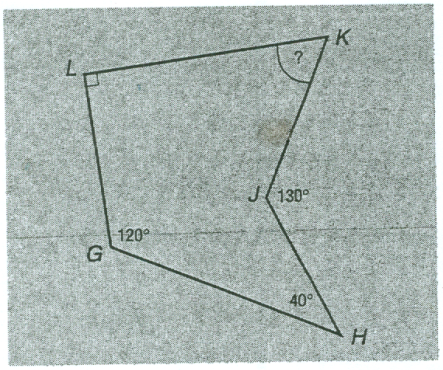


b)

4

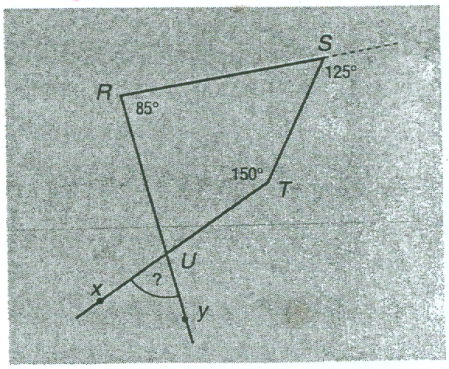
4. A parts designer produces these plans. Find the missing angle measure indicated in each. Justify your answer.

a)



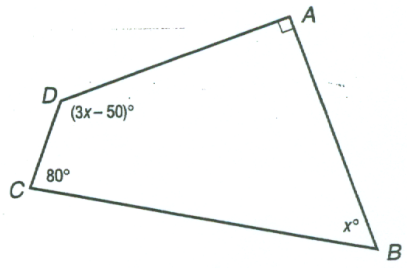
∠K =

b)



∠xuy =

5. Find the measure of the missing angle in this piece of vinyl.



2

∠D = ∠B =

6. Andrew is building a play area in his backyard for his two children. The play area has room for a sandbox. Andrew wants the sandbox to be shaped like a regular hexagon so that it can seat four more children. Calculate the measure of the central angle of one of the isosceles triangles that make up the sandbox.

2

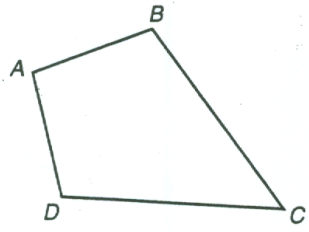
7. How many diagonals can be drawn in a 14-sided polygon?

1

8. From Vertex *A*, draw all possible diagonals in each polygon. Give the number of sides, then find the number of triangles that are drawn in each figure.

4

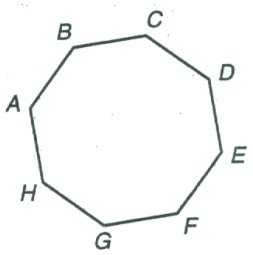
a)



Number of sides: _____

Number of triangles: _____

b)



Number of sides: _____

Number of triangles: _____

9. Complete the following statement.

The sum of the interior angles of a triangle is _____ degrees.

1